Minimum Reporting Requirements for Analytical Data (Chemistry)
for the
Water Quality Planning Bureau

SOP WQPBDMS-010

Approvals

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Introduction and Background

The Water Quality Planning Bureau (herein "bureau") of the Montana Department of Environmental Quality collects samples of water, sediment, and tissue for use in the development of water quality standards and for water quality standards attainment decision-making. Annually, the cost of this testing may run into the hundreds of thousands of dollars. However, the true cost of the analyses may become much greater if the data represented in analytical reports are incomplete, inaccurate, or are challenged and determined to be indefensible; undermining the resource protection decision-making for which they are the basis.

Scope

The minimum reporting requirements established in this SOP are based on the National Environmental Laboratory Accreditation Conference (NELAC) standard of 2003. This standard for the reporting of analytical chemistry data is recognized as the national standard by the Environmental Protection Agency (EPA) within the scope of

> *NELAC Scope*
>
> *"The scope of NELAC shall encompass the necessary environmental sampling and testing to serve the needs of the states, United States Environmental Protection Agency (EPA), and other federal agencies involved in the generation and use of environmental data, where such generation or use is mandated by EPA statutes and pursuant regulations. Organizations are encouraged to use the NELAC standards for all other environmental sampling and testing."*

This Standard Operating Procedure (SOP) sets the minimum standard for reporting analytical chemistry data to the bureau. It is focused on chemistry data processed by private, government, and higher education institution analytical laboratories that are submitted to the bureau in support of water quality standards attainment decision-making or total maximum daily load (TMDL) development.

This SOP is required to be included in contracts let by the bureau to contractors performing analytical testing and grantees who will subcontract the collection and analysis of chemistry data which are funded directly or indirectly by Clean Water Act Section 104, 106, 319, or 604 grants.

The standard shall be used as acceptance criteria for all other contracts let by the bureau involving the generation of analytical chemistry data.

As provided in the NELAC Scope, community information and education projects described as Levels I or II in the Montana Watercourse Volunteer Water Monitoring Guidebook (2007 Montana Watercourse), which are funded under EPA 319 based funds, are not mandatory environmental data generation programs and are not intended to satisfy EPA statutes or regulations. These community information and education projects are encouraged to supply as much of the information as possible as described in this SOP, but are otherwise exempted from compliance with this SOP.

Minimum Reporting Requirements for Analytical Chemistry

The bureau requires that all analytical reports are comprised of three main elements; a hardcopy report, a quality control summary, and an electronic deliverable.

The following sections describe each of three elements.

Hardcopy Report

All analytical chemistry data identified as a deliverable in a Water Quality Planning Bureau contract must be reported in Hardcopy format. A Hardcopy is defined as either a paper or an electronic Adobe portable document format (pdf) report of the results of the analytical test or tests. Hardcopy report must include:

Facility & Staff

1. Title (e.g., "Test Report", "Laboratory Results", "Certificate of Analysis")
2. Laboratory Identification (Name, Address, and Phone Number)
    a. Analyses subcontracted to a second or third tier laboratory must be identified.
3. Authorizing Staff (*Function* and *Signature* of laboratory staff authorizing the release of the report.)
4. Date of report issuance

Document Control, Data Integrity, and Analysis

1. Unique identification of the test report (such as the report number), and on each page an identification in order to ensure that the page is recognized as a part of the test report and a clear identification of the end of the report.
    a. This can be accomplished by either;
        i. The total number of pages may be listed on the first page of the report as long as the subsequent pages are identified by the unique report identification and consecutive numbers, or
        ii. Each page is identified with the unique report identification. The pages are identified as a number of the total report pages (example: 3 of 10, or 1 of 20).
    b. Other methods of identifying the pages in the report may be acceptable as long as it is clear to the reader that discrete pages are associated with a specific report, and that the report contains a specified number of pages.
2. The name and address of the client. Also, the client's project name, if known.
3. A description of, and unambiguous identification of the sample(s), including:
    a. The client's sample identification code
    b. The laboratory's unique identification code
    c. Description of sample condition upon receipt.
    d. Description of sample media or matrix (i.e., water, sediment, etc.)
4. Analysis
    a. Identification of the parameter, constituent, characteristic, or property being reported

b. Analyst Identification (Minimum: Initials of laboratory staff who performed each analysis)
c. Identification of the analytical method used to obtain results
    i. The reference method used is to be reported unless;
        1. A significant modification to the reference method has been made by the laboratory but the analytical approach generally follows the reference method. In such cases, report the reference method and indicate that it has been modified (examples "EPA 365.2 (M)", "SW-846 8021 Mod", or "APHA SM 4500-P F (Modified)"). Avoid using the abbreviation "M" where the reference method ends with an alpha character.
        2. The method is a performance based method. Cite the laboratory's Standard Operating Procedure (SOP).
    ii. The preparation method used is to be reported unless the preparation is included in the reference method.
        1. The preparation method used must be listed separately where a separate holding time is listed for the sample extract (example 40 CFR Part 136 Table II, Phenols - 7 days to extraction, 40 days after extraction to analysis.)
d. Analytical Results
    i. Analytical results must be rounded to reflect the decimal places included in the MDL (e.g., a result of 0.325 with a MDL of 0.1 is rounded to 0.3).
    ii. A maximum of three significant figures are to be reported
    iii. Identification of the Method Detection Limit (MDL[1])
    iv. Identification of the units of measure. Use metric system for reporting results unless the result is a dimensionless ratio or has a unique scale as a result of the method used (e.g., Color in ADMI units).
    v. Identify whether results are reported on a dry-weight or wet-weight basis.
    vi. Identify any method or laboratory failures that may influence the precision, bias, or defensibility of the result (e.g. holding time failures).
e. Dates & Times
    i. Date and time of sample collection (per sample)
    ii. Data and time of sample receipt (per sample)
    iii. Date and time of sample preparation, if any (per result)
    iv. Date and time of sample analysis (per result)
f. Optional Information
    i. Reference to the sampling plan and procedures used by the laboratory or other entities where these are relevant to the validity or application of the results.
    ii. A statement to the effect that the results only relate to the samples described herein.
    iii. A statement that the certificate or report shall not be reproduced, except in full, without the written approval of the laboratory.

[1] MDL is calculated per 40 CFR Part 136 Appendix B, or APHA Standard Methods for the Examination of Water and Wastewater 20the Edition 1030 C (2.) Determining Detection Levels, paragraph 3.

Summary of Quality Controls

1. Method (Batch) and Sample Controls, where required in reference method
    a. Negative control (e.g., Method Blank) are not required for analyses that do not have negative controls (e.g., pH)
    b. Precision control (e.g., Method Duplicates)
    c. Accuracy controls (e.g., Method Control Samples, Lab Fortified Blanks, Standard Reference Materials, Matrix Spikes)
    d. Preparation Controls (e.g., Surrogates)

2. Calibrations & Method Performance, where required in reference method (*Optional Reporting: records may be retained securely at laboratory facility*)
    a. Initial Calibrations/Calibration Curve
    b. Continuing Calibration Verification or Instrument Performance Checks
    c. Continuing Calibration Blanks
    d. Internal Standards
    e. Interelement Correction Standards (e.g., ICSa, ICSb)
    f. Serial Dilution
    g. Analytical Spikes (e.g., Post Digestion Spikes)

Electronic Data Deliverable (EDD)

The standard for reporting analytical data electronically to the WQPB is a STORET compatible deliverable. Templates for the STORET deliverable are available from the DEQ Website (Data Management) at http://www.deq.mt.gov/wqinfo/datamgmt/STORET_SIM_Support.asp.

Data deliverables may be required to be submitted directly to the Data Management section of the WQPB or contractors and grantees may be required to conduct data loads directly into STORET via WebSIM. In the case of WebSIM data loads, the "data deliverable" to the WQPB is a record of a successful data load into STORET. Guidelines for using the WebSIM applications are found in WebSIM Specific Guidance document available from the DEQ Website (Data Management) at http://deq.mt.gov/wqinfo/datamgmt/WebSIM%20Specific%20Guidance.pdf

References

2007, Montana Watercourse of the Montana Water Center, Volunteer Water Monitoring Guidebook.

2004, 40 CFR Part 136 (July 1, 2004), Appendix B, Definition and Procedure for the Determination of the Method Detection Limit.

1998, American Public Health Association (APHA) Standard Method for the Examination of Water and Wastes, 20th Edition

2003, National Environmental Laboratory Accreditation Conference (NELAC), Part 5 Quality Systems, Section 5.5.10 *Reporting of Results.* EPA/600/R-04/003